



Research Paper

Ecotourism, biodiversity conservation and livelihoods: Understanding the convergence and divergence

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ABSTRACT

Ecotourism, natural resource conservation, and local livelihood are one of the most talked-about issues globally. It is seen as nature-based tourism that addresses two primary attributes: livelihood improvement and biodiversity conservation. The present study does an integrative literature review on ecotourism to comprehend the varied views by pinpointing the gaps for future research. The study accomplishes the research goal in two ways. First, the descriptive analysis of the research is carried out using a categorization framework containing articles published between 2002 and 2021. Second, content analysis is identified as an observational approach to systematically evaluate resources and thematic analysis is used to address the research questions. The findings demonstrate that, despite variations over the years, the overall publication trend in ecotourism is growing. The majority of ecotourism research is conducted in developing nations and the results show that they are still struggling to manage their resources. The review concludes that there exists insufficient evidence base for the actual functioning of ecotourism. Moreover, a few ecotourism studies have considered the importance of good governance, the role of tour guides, and the impact of psychological, technical, and political factors. The issue of climate change and carbon footprints are further addition to it. The study recommends maximizing the potential benefits of biodiversity conservation with the help of a “coexistence model”, i.e., community-based ecotourism (CBET). Further, measuring the carrying capacity of ecotourism sites and providing vocational training to the unskilled local community will enhance the overall efficiency of the ecotourism sector. Lastly, it would be a step ahead to build proper knowledge about the role of eco-tourist and the use of eco-certification for a successful ecotourism business.

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1. Introduction

Ecotourism has been gaining momentum in biodiversity hotspots pertaining to its potential to boost both rural livelihoods and environmental conservation. It has the ability to alleviate poverty, which is profoundly embedded in several areas of society (Ferraro & Hanauer, 2014; Makindi, 2016; Sirivongs & Tsuchiya, 2012). The International Ecotourism Society (TIES) defines ecotourism as “ethical travel to natural areas that help the well-being of local people and conserves the environment.” Thus, the essence of ecotourism consists primarily of (i) a nature-based solution; (ii) a sustainability dimension from the standpoint of conservation; (iii) a sustainable human factor considering local people's participation and benefits; (iv) learning, education, and

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awareness; and (v) ethical marketing and business management of indigenous products. Furthermore, it serves as a “human shield” by deterring negative externalities like mining, logging, and poaching (Ouboter, Kadosoe, & Ouboter, 2021). It also promotes recycling and defends against the ongoing threat of global warming and pollution (Poyyamoli, 2018). Thus, ecotourism has been seen in the travel industry as a lifestyle, a collection of activities, and a set of principles if properly planned and performed (Honey, 2008).

As a subcategory of sustainable tourism, it contributes to revenue generation via effective market analysis (Cabral & Dhar, 2019). The growth and magnitude of ecotourism show that, during the 1990s, it increased at a pace of 10% to 30% every year (Honey, 2008). In the 2000s, it grew three times faster than the whole tourism sector (Honey, 2008). Together, nature tourism and ecotourism make up about 20% of international tourist travel (R. M. Self, D. R. Self, & Bell-Haynes, 2010). Currently, ecotourism has become one of the fastest-growing sections of the travel industry, accounting for more than 6% of global gross domestic product (GDP) (UNWTO World Report, 2017), and is anticipated to grow seven times faster than the rest of the tourism industry. In 2019, the global ecotourism sector was valued at 181.1 billion US dollars. The industry was expected to reach 333.8 billion US dollars in 2027, with a 14.3% compound annual growth rate (CAGR) (Lock, 2021).

Ecotourism has been advocated as a beneficial phenomenon, but it has also been condemned for the lack of precision in its many definitions (Butcher, 2007; Butler, 2018). From a human development perspective, Butcher (2007) analysed ecotourism's potential as a strategy for integrated conservation and development (ICDP) in rural developing countries from the standpoint of human development. Butcher makes a compelling case in his book that involving the rural poor in developing country communities with NGO programs binds them to aid and assist based on a set of pre-set criteria established in the West. In a nutshell, the power gap between the rural poor and relatively wealthy western-based NGOs may be legitimized via the use of discourse that emphasizes sustainability and community empowerment. From Butler's (2018) viewpoint, many people hold the view that ecotourists are the ideal kind of travellers compared to mass tourists since they are willing to go to considerable lengths to see less-visited places. However, it is sometimes questioned if, due to their extensive travel, eco-tourists leave larger environmental footprints than other visitors. Eco-tourists are already being categorized as sustainable visitors, hence this reality is being overlooked. Therefore, a cost and benefit assessment of nature-based tourism is important for wild and sensitive locations rather than merely categorizing kinds of tourism or tourists as sustainable or not (e.g., eco-lodges, the remote regions that need extensive long-haul travel to visit) (Butler, 2018).

While several review studies on the sectoral effect of ecotourism have been conducted (Das & Chatterjee, 2015; Kiper, 2013; Poyyamoli, 2018), there have been comparatively few research or evaluations of the sectoral impact of ecotourism in developing and developed nations. This study examines the consequences and solutions of ecotourism via an in-depth literature review that presents diverse points of view and implications. The descriptive analysis of the paper is first conducted using a categorizing approach. Selected papers are classified and coded, and the percentage of each study in each structural dimension is calculated. Second, the study addresses the following key research questions: (a) what are the positive consequences of ecotourism in different countries selected for the evaluation? (b) what are the negative repercussions of ecotourism that prevent it from functioning properly or from being channelled? (c) what solutions should be undertaken to address the significant issues?

Different countries have attractive tourist destinations because of cultural diversity, customs, and wildlife. It has been stressed that ecotourism is more widespread in developing countries than in developed countries and that geographic region is a key deciding element in determining the effect of ecotourism (Doan, 2010). Several developing nations have successfully modernized their ecotourism sectors to achieve economic stability while reducing negative environmental and social consequences. The impact is palpable, as these enterprises helped to alleviate poverty and promote peace in Costa Rica, Ecuador, Tanzania, Kenya, India, and Nepal (Honey & Gilpin, 2009). These nations account for a significant share of international tourism and have become an increasingly important source of foreign currency inflows (Das & Chatterjee, 2015; Eagles, 2002). Besides, third-world nations have a significant comparative advantage when it comes to enticing eco-tourists. Among these are the world's highest mountains; beautiful waterfalls; calm beaches surrounded by coral reefs; and unusual flora and wildlife. But the most important matter of concern is that ecotourism activities cannot take place unless there is some environmental impact. Supporting it, Magio, Velarde, Santillan, and Rios (2013) expressed that impoverished countries have mindlessly accepted and utilised the concept of ecotourism, although many do not understand its true meaning.

According to the United Nations SDGs Report (United Nations, 2022), around 70 million indigenous people rely on forests for a living. Mostly, in underdeveloped nations, traditional plant-based remedies are used by 80% of rural people for basic healthcare. Moreover, protected areas are currently covered by 15% of terrestrial and freshwater ecosystems and 7% of marine regions, but they only cover a portion of critical biodiversity sites. These regions are not yet completely biologically representative or successfully maintained. Also, poor rural women rely heavily on common pool resources and are particularly vulnerable to their decline. Furthermore, approximately 7,000 species of flora and fauna are documented in illicit commerce, affecting 120 nations, whereas unlawful poaching and wildlife trafficking continue to obstruct conservation efforts.

Again, the allocation of ecotourism profits indicates major disparities between the indigenous population and external stakeholders (He et al., 2008). Also, a typical issue among developing nations is that rules are not consistently followed due to insufficient labour, technology, financial and administrative resources (Agrawal & Redford, 2006). First, according to Coria and Calfucura (2012), the relationship between ecotourism and indigenous people in developing nations is primarily influenced by the unequal distribution of economic gains, which favours stakeholders outside of the protected area. Second, indigenous groups are discouraged from engaging in ecotourism due to a lack of community sovereignty over land and resources. Moreover, the uneven power relationships between stakeholders and indigenous people delineate that the latter have no genuine say in management choices. Finally, successful ecotourism initiatives may become victims of their success if visitor numbers are not rigorously

managed (Wishitemi, Momanyi, Ombati, & Okello, 2015). In protected areas, negatively advertised ecotourism devastate the ecology, and such initiatives foster “eco-terrorism” rather than “ecotourism” (Honey & Gilpin, 2009). Despite economic, sociological, and climatic differences, Stronza and Durham (2008) found that most ecotourism projects in developing countries attempt to imitate those in developed ones. Also, the national parks in these nations are relatively in their nascent stage, lacking eco-friendly infrastructure. Thus, problems like soil erosion and poor sewage treatment have emerged from unsustainable tourist planning.

Therefore, ecotourism policy is disorganised, owing mostly to ambiguous and contradictory elements within it. As a result, this study attempts to investigate critical features of ecotourism research in various developing and developed countries' protected regions. It is critical to do the same since the nations, despite their diversity, are becoming ecologically degraded and so need a clear ecotourism strategy, to which this article will look for an answer.

The paper has been divided into five sections, allowing a thorough discussion of different aspects. The first section introduced the concepts and background of the study considered for the analysis. The second section goes through the research methodology and study framework. The third section focuses on descriptive analysis based on several criteria, while the fourth section provides an overview of ecotourism research in various nations, including research challenges. The fifth section will provide an overview of the conclusion, limitations of the study, and future actions for further research.

2. Methodology

The integrative literature review method has been used and its guidelines were followed as per the recommendation by Torracco (2005). The purpose of this study is to provide descriptive arguments about the present state of ecotourism (Cabral & Dhar, 2019; Otowicz, Macedo, & Biz, 2022; Zopiat, Pericleous, & Theofanous, 2021). Content analysis has been identified as an observational approach for systematically evaluating various sorts of resources. Several researchers have used this approach for literature reviews including Chandel and Mishra (2016), Das and Chatterjee (2015), Camprubí and Coromina (2016), Cabral and Dhar (2019), Hasana, Swain, and George (2021), Wondirad (2019), and Puri, Karanth, and Thapa (2019). As per Berg (2009), content analysis is a “careful, detailed, systematic examination and interpretation of a specific body of material to identify patterns, themes, biases, and meanings”. It considers the transformation of information and communication that will be analysed and compared with feasible interpretation.

Considering past review analyses, Agrawal and Redford (2006) conducted research on ecotourism as a strategy for poverty alleviation and biodiversity conservation, focusing only on peer-reviewed articles. Their conclusions were detailed and recommended for better policy implementation to comprehend the trade-offs between the aforementioned notions. There are also case-specific qualitative literature reviews that individually peer-reviewed the status of ecotourism in developing countries such as India (Ghosh-Harihar et al., 2019; Poyyamoli, 2018; Spicer, 2020), and Tanzania (Mgonja, Sirima, & Mkumbo, 2015) or developed countries such as Mexico (Morgan & Winkler, 2020) and Botswana (Stone, Stone, Mogomotsi, & Mogomotsi, 2021). Studies on ecotourism's relationship with particular aspects such as women empowerment (Lenao & Basupi, 2016), supply and demand-led analysis (Sharpley, 2006), and Covid-19 effect (Fernández-Bedoya, Meneses-La-Riva, & Suyo-Vega, 2021) were also examined using qualitative document analysis. Renowned researchers, such as Kiper (2013), Kiss (2004), and Kline (2011), only discussed the overall theme of ecotourism. They examined the relationship of ecotourism with its varied factors (economic, social, and environmental) and its positive and negative impacts. Again, with a small number of research outcomes (99 articles), Hasana et al. (2021) used a systematic literature review and content analysis to analyse only community engagement in ecotourism. Wondirad (2019), on the other hand, employed summative and thematic content analysis on a large number of study findings (470 articles) to analyse overall ecotourism research. He also focused on a single section (ecotourism studies by specific geographic locations) to illustrate the disparities between developed and developing countries. Therefore, in many studies, even if descriptive analyses were performed, qualitative analyses were lacking or they disregarded the significance of descriptive analysis. Similarly, the use of databases and how or why research papers were included or excluded were less discussed. As a consequence, this review analysis covers gaps in the previously described review methodologies and incorporates a mix of qualitative and quantitative research. Furthermore, the integrative literature review has been less explored. Therefore, it has been used with both content and descriptive analysis to explore the many features of ecotourism in the current period. Also, the present review study is based on variations in ecotourism research conducted in both developed and developing nations.

As a result, the investigations were coded, and their quantitative findings were included in the final report (Appendix Table A). The measures adopted in this research are (Fig. 1) a) conducting a thorough search of academic databases for publications published on the topic; b) designing a categorization system for classifying available knowledge of the topic; c) sorting and categorizing items logically; d) conducting a quantitative analysis of the chosen studies; e) describing the research implications for future investigations.

Thematic analysis is utilised to address the research questions stated in the study for the second objective. The explanations for the research questions were developed from topics such as the beneficial effect of ecotourism, problems, and solutions. The timeframe studied in this research for article selection ranged from 2002 to 2021. The review is based on 102 research resources disseminated over the period of 20 years (2002–2021) of publication. The United Nations recognized 2002 as the International Year of Ecotourism, indicating the transformation of ecotourism from a business opportunity to a method of assisting nature-based countries in their pursuit of sustainable development (Butcher, 2006). As a result, the year 2002 was picked as the starting point for examining articles, and the year 2021 represents the beginning of working on this review piece.

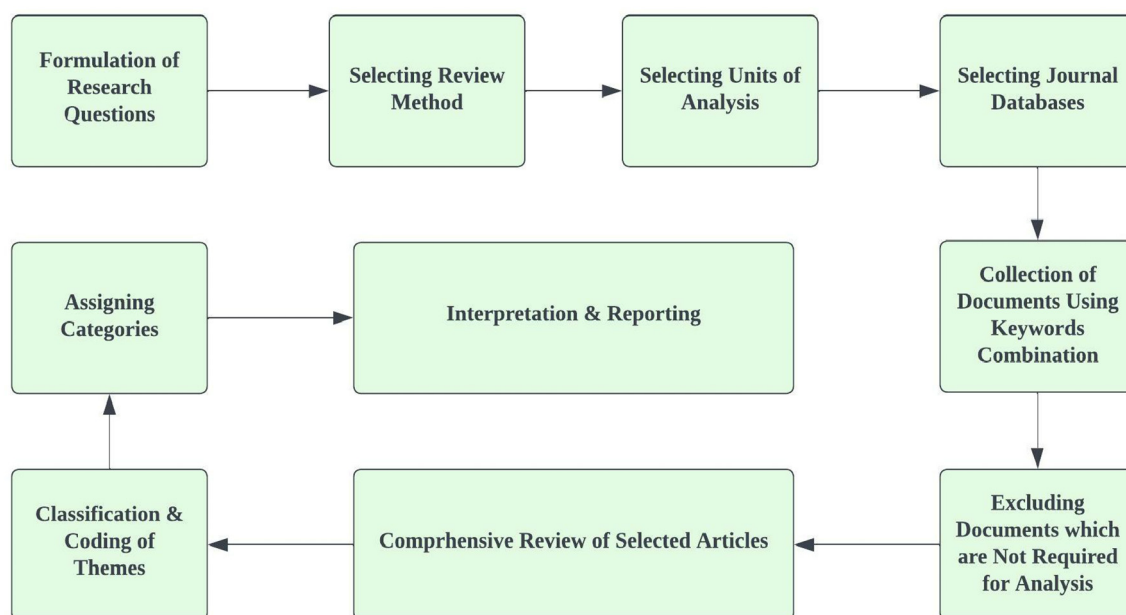


Fig. 1. Research design.

Source: Hasana et al. (2021)

A systematic periodic search was carried out on 16th May 2022, to get access to published literature on the subject. To find research papers, keywords such as “ecotourism” AND “developing country” OR “developed country” AND “local community” OR “community-based ecotourism” were employed. Initially, the writers used library services such as Science Direct and Web of Science to find the chosen publications. The keyword search yielded 912 items and 115 items, respectively (a total of 1027 items). Then the authors searched specialized journal databases such as Elsevier, Taylor & Francis, Sage Publications, Springer Link, and others to supplement the examined scholarly documents in the study. The review was conducted using various published materials such as journal papers (both reviews and research), conference proceedings, book reviews and chapters, case reports, etc. In the next step, the final selection of 102 documents was made following the highly critical and accurately observed eligibility criteria for research articles (Table 1). Even if the materials selected for the study are limited, they are all pertinent, specific, and vital to portray the micro-centric research notion of ecotourism from a broader viewpoint. Then the descriptive variables are quantified, interpreted, and reported using Microsoft Excel.

Fig. 2 has been designed to delineate the impacts and conservation strategies of ecotourism and how it affects the livelihoods of local people. The guide for review analysis would address key research questions and the current status of ecotourism studies, which would be detailed in the forthcoming review section.

3. Quantitative analysis of the chosen studies

3.1. Year-wise distribution of articles

The aforementioned review study was based on 102 research publications examined between the years 2002 and 2021, as shown in Fig. 3. The publications were divided into three phases. The first phase (2002–2007) (15.68%) has the least number of documents compared to the second (47.05%) and third phases. The number of publications increased significantly during the third phase (2015–2021), accounting for 48.03% of all publications. The publishing trend reveals significant tendencies by categorizing all documents into three stages.

- (i) First phase (2002–2007). Documents comprise conceptual and qualitative studies, multidimensional factors, advocacy, and criticisms of ecotourism.
- (ii) Second phase (2008–2015). Documents primarily focus on economic, environmental, and sociocultural factors of ecotourism, increase in quantitative analysis, raising interest and curiosity among academicians, and implications in protected areas.
- (iii) Third phase (2016–2021). Documents discuss a more gender-centric approach, emphasis on the role of institutions and stakeholders, rigorous primary research, pandemic (Covid-19), homestay-based ecotourism, climate change, and eco-certification.

Table 1

Document extraction process for the review analysis.

Topic	Inclusion/Exclusion criteria			
Database	Science Direct	Number of documents	Web of Science	Number of documents
Keywords	("ecotourism") AND ("developing country" OR "developed country") AND ("local community" OR "community-based ecotourism")	1200	("ecotourism" AND "developing country" OR "developed country" AND "local community" OR "community-based ecotourism")	124
Year	2002–2021 (759)	441	2002–2021 (49)	75
Article type	Review articles	22	Review articles	4
	Research articles	401	Research articles	69
	Book reviews	16	Book chapters	1
	Case reports	1	Conference proceeding	1
	Conference abstracts	1		
Subject area/Web of Science categories	Social sciences	311	Hospitality leisure sport tourism	37
	Economics, econometrics and finance	108	Environmental studies	22
	Arts and humanities	22	Biodiversity conservation	8
			Social sciences interdisciplinary	5
			Economics	3
Index	N/A	441	Science Citation Index Expanded (SCIE) (2), Social Sciences Citation Index (SSCI) (2), Emerging Sources Citation Index (ESCI) (1), Conference proceedings Citation Index-Science (CPCI-S) (1) Conference Proceedings Citation Index-Social Science and Humanities (CPCI-SSH) (1)	68
After the removal of duplicate records (22)	487			
Exclusion reasons (385)	- Inadequate titles, abstracts, and article content, for a more detailed analysis (e.g., the text that did not consider the theme ecotourism and/or livelihood and/or biodiversity) (169) - Articles that did not consider the significance of ecotourism, biodiversity and livelihood in the case of both developed and developing countries according to World Bank categorization based on gross national income (GNI) (182) - Articles other than the English language (8) - Publications based on issues like artificial intelligence-based ecotourism and homestays in urban settings (8) - Publications on subjects like biology, anthropology, geography, political science, sociology, etc. (18)			
Total documents	102			

Note: '()' represents the excluded number of articles.

3.2. Distribution of articles in journals

The frequency distribution of articles has been shown in Fig. 5. The Journal of Sustainable Tourism published nine papers related to the topic, followed by the Tourism Management Perspective and the Journal of Ecotourism, accounting for seven papers each (22.54% of 102). It can be observed that the major number of articles (37 articles, accounting for 36.27% of 102) were published in tourism journals such as *Tourism Management Perspectives*, *Tourism Management*, *Journal of Sustainable Tourism*, *Annals of Tourism Research*, *International Journal of Tourism Research*, *Journal of Indonesian Tourism and Development Studies*, *Czech Journal of Tourism*, *Tourism Geographies*, *African Journal of Hospitality, Tourism, and Leisure*, and *ASEAN Journal on Hospitality and Tourism*. The multidisciplinary nature of the topic was also inferred, as it has been published in journals of subject areas such as management and economics (6.86%) (*Journal of Environmental Management*, *International Journal of Economics and Management*, *Journal of Tourism and Hospitality Management*, *Journal of Hospitality Marketing and Management*, *Journal of Emerging Trends in Economics and Management Sciences*, *Journal of Economic Surveys*, *Forest Policy and Economics*), ecology (3.92%) (*Trends in Ecology and Evolution*, *Landscape Ecology*, *Ecologica*, *Ecological Economics*), wildlife (1.96%) (*Journal of International Wildlife Law and Policy*, *African Journal of Wildlife Research*) and environment (3.92%) (*Environmentalist*, *Journal of Environment and Earth Science*, *Environmental Management*, *Journal of Environmental Management*, *International Journal of Sustainable Built Environment*).

3.3. Classification of countries

In this respect, the research divides the geographical setting of all nations into four groups based on the World Bank's categorization of developing and developed countries based on gross national income (GNI). Firstly, income less than 1,046 US dollars characterises low-income countries; income below 4,095 US dollars describes lower-middle-income countries, and both are considered to be developing countries. Then, upper-middle-income nations (income less than 12,695 US dollars) and high-income countries make up the developed world (income above 126,95 US dollars). According to the findings, the majority of research in the geographical context was done in lower-middle-income nations (76.08%), with the least number of studies undertaken in low-income countries (30.43%). Upper-middle-income nations had the second most proportion of studies (50.11%), followed

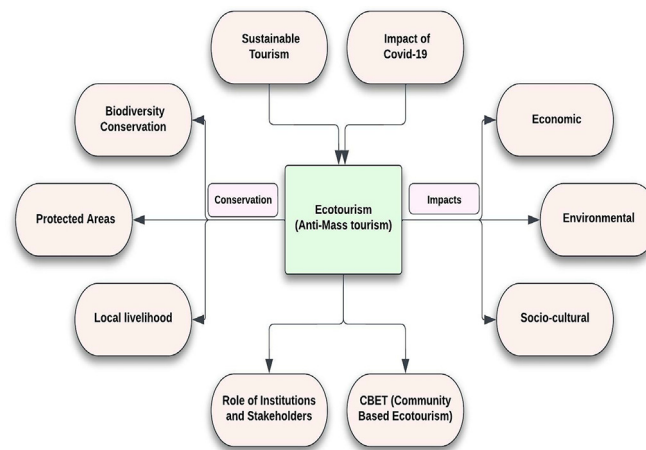


Fig. 2. Guide for review analysis.
Source: Author's construction

by high-income countries (36.85%) (Fig. 4B). Overall, the combined contribution of emerging countries is greater than that of rich countries.

Considering the often-stated argument that poor nations have a comparative resource advantage over wealthy countries in the ecotourism industry (Wondirad, 2019), the following factors might have important ramifications. On one hand, the developing countries mostly focused on ecotourism & local community participation, attitude & perception as well as a cost-benefit analysis of the ecotourism business. On the other hand, studies conducted in wealthy countries have focused on issues including ecotourists motivation, perception, and willingness to pay, as well as ecotourism certification and the involvement of stakeholders. Again, ecotourism research in developed nations deals with more varied and specialized forms of ecotourism and topics related to consumer perception and ethical business practices. In contrast, developing destinations focus more on general ecotourism themes and aim to examine developmental issues. China, South Africa, and Latin America are the most frequently studied developing regions. In the case of developed countries, the United States leads, followed by the United Kingdom, Australia, Canada, and New Zealand in terms of research in ecotourism.

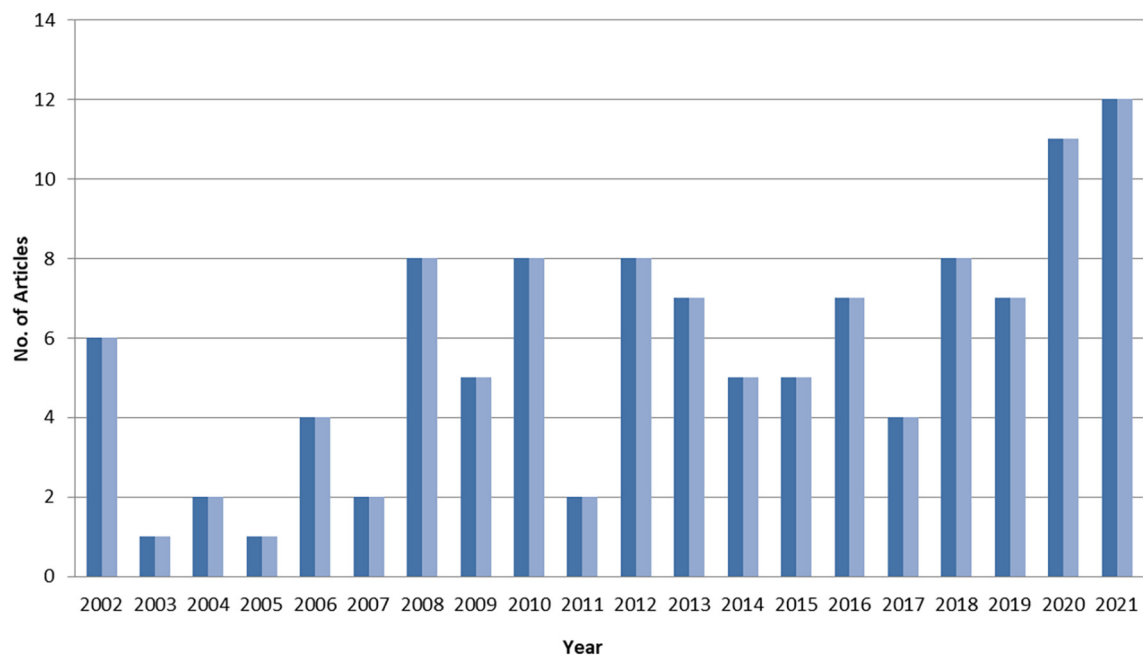


Fig. 3. Year-wise distribution of research papers considered for the study.

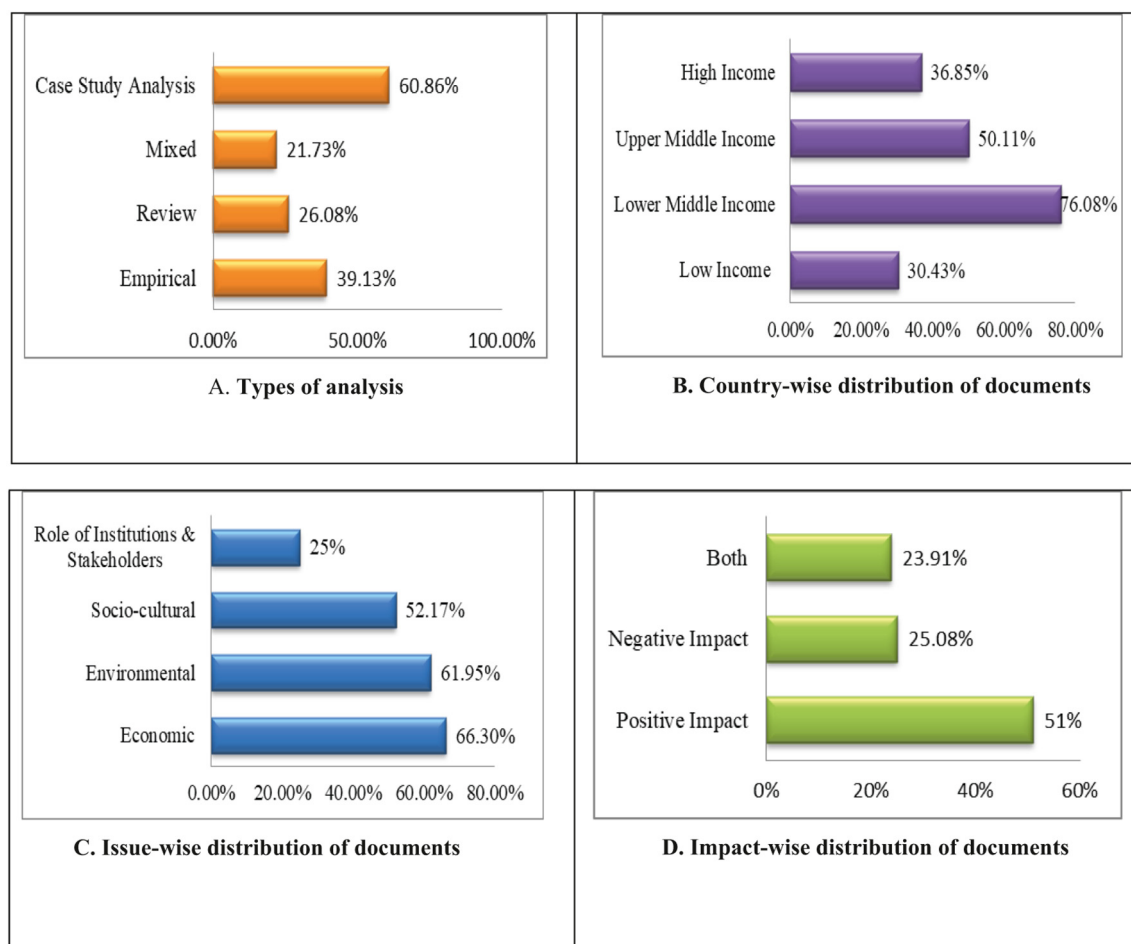


Fig. 4. Quantitative analysis.

3.4. Emphasis on ecotourism & key stakeholders

The articles were classified depending on their emphasis on ecotourism. Table 2 allows for the identification of the subcategories. The subcategory of “Overall Ecotourism” accounted for about 26.08% of all research. The majority of research (32.60%) focused on “ecotourism connected with more than one factor,” while other categories included “ecotourism in synergy with one factor” (21.73%) and “ecotourism is not the primary component of the study” (19.56%). The fourth category primarily delineates the impact of tourism or the idea of nature-based tourism in the analysis.

The key stakeholders comprise local communities, hotel and tourism agencies (9.78%), visitors (10.86%), and government and non-governmental organisations (NGOs) (7.60%). According to the data, studies involving local communities were more prevalent (50%), followed by studies involving all stakeholders (40.21%). Thus, it can be interpreted that little research has been done incorporating the government and the commercial sector as stakeholders.

3.5. Type of analysis and research method

The research techniques used by researchers in their separate papers included the use of a single research method or a combination of research methods. Because of numerous studies in varied geographical contexts, case study analyses (60.86%) are the most frequently used analysis. Because of substantial work on primary data analysis and field studies, empirical analysis is the study's second most utilised approach (39.13%) since it allows researchers to connect more directly with the local community. It is followed by a review analysis (26.08%), focusing on critical evaluation. Overall, qualitative (interviews, focus groups, literature reviews, etc.) and quantitative (surveys, experiments, observations, etc.) approaches accounted for 59.78% and 18.47%, respectively. Mixed methods studies accounted for 21.73% of all studies (Fig. 4A).

Key informant interviews, focus group discussions, personal observation, and mixed methods analysis are the leading research methodologies as ecotourism research focuses on local communities and developmental challenges. In terms of data analysis,

Name of the Journal

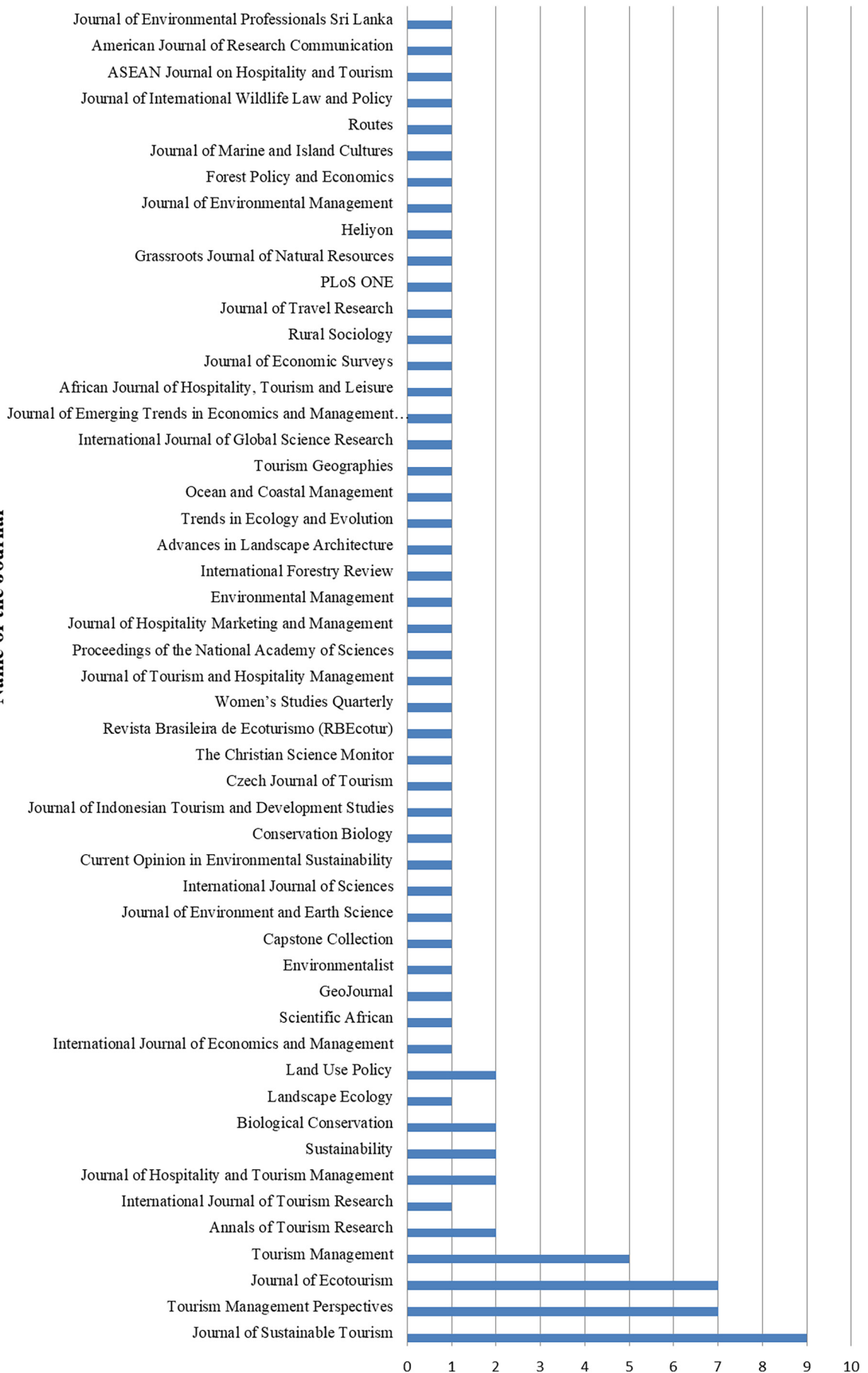


Fig. 5. Article distribution in different journals.

Table 2

The classification framework applied in the analysis.

Focused contexts	Sub-categories	Codes
Classification of all countries (by World Bank based on GNI)	High-income countries	1
	Upper-middle-income countries	2
	Lower-middle-income countries	3
	Low-income countries	4
Emphasis on ecotourism	Overall ecotourism	5
	Ecotourism in synergy with one factor	6
	Ecotourism linked to more than one factor	7
	Ecotourism is not the main part of the analysis	8
Research method	Quantitative	9
	Qualitative	10
	Mixed	11
Type of analysis	Empirical	12
	Review	13
	Case study	14
Key stakeholder	Local community	15
	Tourists	16
	Hotels and tourism agency	17
	Government and NGOs	18
	All	19
	Economic	20
Factors linked to ecotourism	Environmental	21
	Socio-cultural & gender egalitarianism	22
	Institution & stakeholders	23
	Positive	24
Impact of ecotourism	Negative	25
	Both	26

researchers mostly used qualitative data analysis approaches such as Q-methodology, Participatory Rural Appraisal (PRA), Social Exchange Theory (SET), Appreciative Inquiry (AI) process, Scheyvens empowerment framework, content analysis, SWOT analysis, C&I, and participatory methodologies. Whereas, descriptive statistics, dichotomous choice contingent valuation method (DC-CVM), travel cost method, replacement cost method, Analytical Hierarchy Process (AHP) method, discrete choice responses model, Analytical Network Process (ANP) based on the Benefits, Opportunities, Costs, and Risks (BOCR) Model, Principal Component Analysis (PCA), simple and multiple linear regressions, and ANOVA were the most frequently used quantitative data analysis techniques.

3.6. Factors linked to ecotourism and the impact of ecotourism

From the perspective of ecotourism-related aspects, Fig. 4 indicates that 66.30% of the articles focused on the economic effect, while 25% of the articles focused on the involvement of institutions and stakeholders. Therefore, it suggests that academicians and researchers should pay greater attention to the actions and consequences of institutions and stakeholders operating inside or outside of a given protected area (PA). Again, considering the impact of ecotourism, it has been observed that 51% of the total articles have primarily focused on the positive impact of ecotourism, with the majority of case studies pointing to its successful application in resolving the conflict between biodiversity conservation and local livelihood. Comparatively, 23.91% of the papers described mixed effects, while the remaining 25.08% emphasised negative effects (Fig. 4D).

4. Review of literature

4.1. An overview of the positive impacts of ecotourism research

The most essential contribution of ecotourism efforts is to give direct (tourist visits, entrance fees, monetary contributions such as environmental conservation levies and voluntary donations, etc.) and indirect (travel and lodging taxes) financial benefits to the local community (Cabral & Dhar, 2019; Das & Chatterjee, 2015; Reimer & Walter, 2013; Sinha, Qureshi, Uniyal, & Sen, 2012). Thus, ecotourism is defined from both the supply and demand perspectives (Wearing, McDonald, & Ponting, 2005). Ecotourism is an ideal replacement for timber extraction and tree cutting for agricultural purposes (Broadbent et al., 2012). The forest sector, in turn, often supplies the ecotourism industry with commercial commodities like handicrafts and rare plant species utilised for medicinal purposes. In the Commonwealth of Dominica, West Indies, the creation of forest product-based decorations, furniture, and house building utilising bamboo has generated a substantial portion of the ecotourism sector's earnings (Hypolite, Green, & Burley, 2002). Furthermore, through ecotourism initiatives, the cost-benefit analysis of conservation projects in South Africa's Makuleke Region of Kruger National Park has led to the region's economic independence (Turner, 2004). In addition, using the Contingent Valuation Method (CVM), Adamu, Yacob, Radam, and Hashim (2015) argued that the majority of tourists

are willing to pay much more than the actual entrance fee for conservation purposes and that the surplus revenue assists protected area's decision-makers in effectively managing their financial policies. The same is true for Amerindian communities in the Iwokrama rain forests, who benefited from ecotourism ventures that increased their living standards (Funnell & Bynoe, 2007).

One of the most significant effects of ecotourism on any PA is its environmental factors and education. The Halle Park in Mombasa, Kimana Sanctuary in the Amboseli, the Kakamega National Reserve, and the Tree-Top lodge in the Aberdares National Park, Britain are some of the examples that have been protected and conserved due to ecotourism development (Belsoy, Korir, & Yego, 2012). According to Butarbutar and Soemarno (2013), clean water is now mainly accessible in various PAs as stringent rules on water consumption have been established and flooding concerns have been handled as a result of afforestation and biodiversity protection. Furthermore, the money generated by ecotourism businesses prevents exploitative activities like mining and slash-and-burn agriculture, as well as the long-term preservation of carrying capacity (ibid.). The money is also invested in organic farming, ensuring the site's long-term financial stability. Ecotourism particularly supports alternative energy resources and solid waste management (Anup, Ghimire, & Dhakal, 2021), which includes the ability to systematically brand mark the conservation sites' environment (Das & Chatterjee, 2015). Furthermore, environmental education strengthens multiple ecotourism goals, such as (i) providing satisfaction through recreation and assisting in getting to know nature closely, (ii) improving individual environmental knowledge and awareness, and (iii) assisting in strengthening visitors' "pro-conservation" values to focus on sustainable conservation of natural assets (Wang, Zhong, Zhang, & Zhou, 2014).

It also promotes human rights, socioeconomic empowerment, and the preservation of traditional culture in the community via decision-making and participation in different activities (Kline, 2011). Ecotourism promotes community development by reducing the constraints caused by social dissatisfaction and resource exploitation (Cabral & Dhar, 2019; Ashok, Tewari, Behera, & Majumdar, 2017; Masud, Aldakhil, Nassani, & Azam, 2017; Nyaupane & Poudel, 2011; Mbaiwa & Stronza, 2010). Nyaupane and Poudel (2011) employed an appreciative inquiry approach in three independent buffer-zone communities near Chitwan National Park in Nepal and found that small-scale and locally owned ecotourism businesses, in particular, are tools for improving livelihood. Furthermore, He et al. (2008) focused on the unequal distribution of ecotourism benefits among various stakeholders and the reasons that encourage local people's participation and frequent use of local commodities can reduce the large social gaps. Ecotourism capacity-building projects primarily help locals, notably the poor and women (vulnerable groups), to become self-sufficient via skill development and leadership training. It endeavours the local people a chance to remain on inheritable land and to resurrect forgotten arts and cultures via community engagement (or tribal culture) (Adom, 2019; Mehta, Baez, & O'Loughlin, 2002). It contributes to the preservation and management of traditional ecological philosophies that promote biodiversity conservation (Adom, 2019; Song & Kuwahara, 2016). A well-known example is Japan, where World Natural Heritage (e.g., Ogasawara Island) is ecotourism certified due to the efforts of the business sector and the governmental body to promote ecotourism (Song & Kuwahara, 2016).

The fifth Sustainable Development Goal (SDG) aims to achieve gender equality and the empowerment of all women and girls by 2030 as a step toward gender parity and women's empowerment. Ecotourism is a management tool that promotes women's empowerment and participation (Moswete & Lacey, 2015). Various studies show that indigenous women are psychologically, socially, economically, and politically empowered by their participation in ecotourism ventures (Deori & Das, 2013; Irandu & Shah, 2014). Women are employed in community-based ecotourism by commercializing their native crafts, while the younger generation is employed as tourist guides (Adom, 2019). This holds the local labour force that is being drained into metropolitan regions in search of work. They also learn about other activities such as becoming tourist hosts and managing their homestays with an emphasis on good sanitation, cleanliness and serving prepared meals to the guests (Deori & Das, 2013; Walter, Regmi, & Khanal, 2018). Examples of women empowerment in the regions like Nepal, Samoa, and Siyabonga can be considered. These women have established their craft production co-operatives which are breaking stereotypes of gender roles (Lenao & Basupi, 2016). In the case of the Kakamega rainforest, the Isecheno women's conservation group was effective in closing larger social, environmental, and economic gaps for sustainable tourism. To become economically empowered, the women's society has been working on ecologically sensitive initiatives such as beekeeping and tree nursery development (Barry, 2012). Similarly, the male population in Chile's Fray Jorge National Park pursues traditional lifestyles, while female groups are heavily involved in tourism-led activities (Qashu, 2012).

In ecotourism, the institutional power structure incorporates three crucial parameters: (i) strong institutional links, (ii) stringent authorisation requirements and fewer visitors, and (iii) resource arrangements and natural resource utilisation (Badola et al., 2018). Furthermore, stakeholders play a critical role in the management of these power systems. For example, the local people, the Natural Resources Conservation Centre, and local governments are the leading stakeholders in Marsegu Island Nature Tourism Park (MINTP), Indonesia, while researchers and the commercial sector are working as supporting stakeholders. In general, multi-dimensional stakeholders with mutual trust via communication, coalitions, and business collaboration show more competent skills for the successful management of ecotourism development (D'Angella & Go, 2009). It is supported by Osman, Shaw, and Kenawy (2018) because ecotourism is indeed linked to other development sectors with strong interconnectivity between government agencies and shared ownership. Moreover, in the case of India, to encourage decision-makers to promote and engage in ecotourism practices, the Ministry of Tourism has been awarding national tourism awards in various categories such as Best Eco-friendly Hotel, Best Responsible Tourism Project, and Best Eco-friendly Practices by Tour Operators in the travel, tourism,

and hospitality sector. These awards are given to members of the local community who have relevant expertise and information about wildlife and traditional culture (Ghodeswar, 2013).

4.2. Unfavourable ecotourism impacts

4.2.1. The commodification of ecotourism & lack of a universal certification program

Mismanagement of ecotourism initiatives causes issues for community members, including disputes over land and natural resources, unfair profit distribution, and cultural exploitation. Again, the commercialisation of ecotourism has destroyed the concept's original meaning (Chandel & Mishra, 2016). This practice is known as “green-washing,” which is defined as “misinformation disseminated by a venture/organisation to market itself as an ecologically responsible firm.” The impact of greenwashers is examined by Self et al. (2010) in the case of the Galapagos Islands, Ecuador, where they are corrupt tourism operators and use ecotourism as marketing tourism. In a similar vein, Terra Choice Environmental Marketing conducted a study on “Six Sins of Greenwashing” in 2007, which revealed that 99% of all “green” items were at least somewhat fake (Judkis, 2008). It takes advantage of the benefits of ecotourism because there is no standard certification procedure for it. This is evident in several PAs where the ecotourism sector is being developed. Ecotourism certification, as defined by Honey and Stewart (2002), is the “procedure of auditing and giving written assurance that a facility, product, service, or management system meets specific standards.” These certification programs include either process or performance requirements, or both. In recent years, the majority of certification programs have only followed a process framework. There are difficulties in having verified and accessible criteria due to the diversity of ecotourism-related products and places. It demotivates people to adhere to the performance framework (Haaland & Aas, 2010). This raises the issue of only improving ecotourism practices rather than improving its standard performance levels. Thus, eco-labelling and certification have become a tool for ecotourism operators to communicate a market signal to prospective partners about the environmental repercussions of tourism. But, research on certification has often shown that it has minimal impact on how customers choose tourist goods (Mgonja et al., 2015). As a result, a universal certification program is needed for quality assurance in the ecotourism industry since it would prevent greenwashing by unethical operators (Judkis, 2008).

4.2.2. Revenue leakages and income inequality

Many ecotourism locations throughout the world are suffering from financial constraints to preserve their natural resources (Wishitemi et al., 2015). Many sites' existence and viability have been jeopardized due to a lack of financing, a rise in the number of visitors, and their ongoing environmental effects (Ghosh-Harihar et al., 2019). Furthermore, revenue leakages caused by corruption have a detrimental influence on the local people's attitude (e.g., Andaman and Nicobar Islands) (Reddy, 2008). Leakages occur as a result of undisclosed local ownership, management, and marketing issues. Furthermore, economic leakage and income inequality among the local community are mainly caused by supply-related (lack of value-added products, costly local products, and unchanging traditional production techniques), demand-related (tourist preferences, seasonal variation in demand), and market-related factors (locals' lack of experience in marketing and marketing techniques) (Lacher & Nepal, 2010). Often, ecotourism exacerbates economic inequality among local communities since establishing and sustaining an ecotourism business demands a significant investment. Moreover, wealthy people are more likely to engage in the sector and enjoy the benefits. It is backed by Ma, Cai, Zheng, and Wen (2019), who compared the Gini coefficients of nature reserves (NRs) in China. Another example to consider is the Thung Yai Naresuan Wildlife Sanctuary in Western Thailand, where non-timber forest products (NTFP) harvest is unequal since one portion of the population possesses specialized equipment, leading to repetitive damage to natural resources (Delang, 2006). As a result of the cumulative impact of revenue leakages and income inequality, illicit wildlife poaching occurs, resulting in human-animal conflict.

4.2.3. Dependence and exploitation of forest resources

Even though ecotourism contributes significantly to forest sustainability and has a favourable influence on economic aspects, there are nevertheless drawbacks. Bhandari and Jianhua (2017) discovered that the unrestricted dependence of local people on forests threatens to damage biodiversity conservation in protected areas (Bhandari & Jianhua, 2017). According to the Food and Agriculture Organisation's (FAO) (2020) report¹ *Global Forest Resources Assessment report (2020)*, the world's forests today cover just four billion hectares. Between 1990 and 2020, an average of 7.8 million ha of forest land was lost, with yearly area loss averaging 4.7 million hectares during the previous ten years (2010–2020). The Himalayan nations have prioritized forest protection and conservation, but forest loss has persisted (Brandt & Buckley, 2018). Brandt, Radeloff, Allendorf, Butsic, and Roopsind (2019) did a complex and extensive study and found that deforestation in the ecotourism region of Yunnan, China was lower compared to non-ecotourism parts of China, but it was two to three times higher than in the ecotourism zones of India, Bhutan, and Nepal. It occurred because China's forest management strategy prioritized profit-reaping above sustainable usage. Furthermore, according to Lee, Huang, and Yeh (2010), ecotourism, among other things, fails to channel the proper flow of forest-based revenue in the long term and induces harmful behaviours within the local population. In terms of ecotourism awareness, Das and Chatterjee (2015) discovered that people living near mangrove forests have lower levels of education and

¹ FAO Global Forest Resources Assessment: Food and Agriculture Organisation (FAO) has been conducting periodic assessments of all forest-related resources in the world with cooperative contributions from member countries. The FAO Global Forest Resources (FRA) offers critical data for determining the size and scope of forest resources, as well as their condition, management, and conservation. Such detailed global features aid the establishment of sound forest and forestry policies, strategies, and investments.

income; therefore, they rely heavily on forest resources for employment and livelihood demands. Also, the rural people have been placed under strain due to a lack of selling prospects for forest-based goods that have little or no value addition combined with exploitative advanced market organisations.

4.2.4. Visitors' impact and experience of PAs

Ecotourism is a double-edged sword because of the destructive effects it may have on the ecosystem when combined with intensive human activity. It increases the severity of environmental degradation and deforestation and disrupts the ecological system (Magray, 2018). A rise in the number of tourists strains regional landscapes, resulting in the building of infrastructure and lodging facilities that damage forests and animal habitats. The Choghakhoor International Wetland in Iran is a very pertinent example since it has been exploited by visitors, who put pressure on the wetland via waste dumping, resource erosion, and damaging vegetation. Additionally, transportation and traffic congestion damage the natural habitats of rare and endangered species (Butarbutar & Soemarno, 2013). It leads to different behavioural changes in animals that may have a significant impact on their nesting and breeding grounds (Kiper, 2013). From a socio-cultural aspect, the visitors' irresponsible actions cause "overpopulation, crime, begging, prostitution, and displacement from indigenous lands" that lead to social impotence. In addition, many PAs lack a suitable orientation program for visitors to understand the importance of biodiversity conservation (Das & Chatterjee, 2015). It, in turn, creates a negative "visual impact" on the visitors' experiences since they will not return to the same location in the future (Newsome, Moore, & Dowling, 2002).

4.2.5. Degradation of land ecosystems and waste accumulation

The environment of Kenya's PAs is threatened by urbanization. Local people may hold resentment in certain cases after being forced to leave their customary lands and receiving inequitable compensation (Tran & Walter, 2014). The story of the Maasai nomads in Kenya, who killed numerous wild animals within the national park to protest ill-treatment by government officials, served as a supporting example (ibid.). In addition, many gaming and sports activities, mostly in PAs, have led to serious land degradation (Belsoy et al., 2012). From an environmental aspect, Spicer (2020) discovered a significant quantity of lead in the Sundarbans biosphere reserve territory, posing a concern to both wildlife and humans. Water shortages and pollution caused by unregulated waste disposal were discovered to be destroying surrounding rivers and fertile fields in the Mombasa region (Belsoy et al., 2012; Santarém et al., 2018). Furthermore, an analysis of the environmental impact assessment (EIA) of ecotourism in Can Gio Mangrove Biosphere Reserve, Vietnam, revealed that waste accumulation is a major worry if visitors, management staff, and local operators in that area are unconcerned about it (Tran & Walter, 2014).

4.2.6. Gender disparity and related issues

The conditions for women are not always favourable in ecotourism development, since many social development initiatives funded by ecotourism earnings flow into clubs controlled by the male population (Wishitemi et al., 2015). According to Morgan and Winkler's (2020) study in Quintana Roo, Mexico, ecotourism is a "gender-blind" industry that reinforces traditional gender norms rather than fostering gender equality and women's empowerment. Women in the tourism business make less money on average and face more hurdles and competition for leadership and management roles than men (Thrane, 2008). In most instances, homestay housing for eco-tourists has created a "double burden" for women in charge of household management. The effort and strain have increased by washing, cleaning, and preparing meals for eco-tourists and their own families (Tucker & Boonabaana, 2012). In northern Vietnam, eco-tourist hosting has placed an additional strain on the female community. Furthermore, although community-based ecotourism (CBET) has been widely touted as a viable alternative to mass tourism, it lacks a clear examination of gendered relationships to a specific ecotourism-related activity (Ruiz-Ballesteros & Hernandez-Ramirez, 2010). In certain areas, the male community has purposefully controlled manufacturing processes and exploited women for raw material supplies (Lenao & Basupi, 2016). It advocates for the empowerment of women via formal education and the development of entrepreneurial learning opportunities (Wishitemi et al., 2015).

4.2.7. Top-down approach & hierarchical governance

In some PAs, labourers are imported from urban areas instead of supervising amateur and less experienced locals (Kiper, 2013). Again, adhering only to the "gun and guard approach" for conservation is another negative issue that puts the basic notion of ecotourism into question (Ghosh-Harihar et al., 2019; Reimer & Walter, 2013). The government, corporate sector, and local community are the primary stakeholders in the development of ecotourism (Funnell & Bynoe, 2007). However, in the case of environmental and common property resources, only hierarchical administration has been discussed (Ostrom, 1990). Furthermore, hierarchical governance and adaptive co-management in ecotourism have been overlooked till now (Plummer & Fennell, 2009). To meet the Aichi Biodiversity Targets² for conservation, a hybrid bureaucracy with layered institutional entities formed with the collaboration of several authorities is required (Badola et al., 2018). Research on Giant Pandas in the Wolong Nature Reserve

² Aichi Biodiversity Targets: It refers to the 20 global targets outlined in the Biodiversity Strategic Plan 2011–2020. They are classified into five strategic objectives: i. to deal with the implicit causes of biodiversity loss by integrating biodiversity into all levels of government and society; ii. to reduce direct biodiversity pressures and encourage long-term use; iii. to improve biodiversity status by protecting ecosystems, species, and genetic diversity; iv. to increase the benefits of biodiversity and ecosystem services to all; v. to improve implementation through participatory management, knowledge, and capacity building (Convention on Biological Diversity [CBD] Secretariat, 2014).

in China adds to the fact that the unequal distribution of ecotourism advantages among various stakeholders results in a substantially less flow of benefits to the rural residents (He et al., 2008).

4.2.8. The effects of Covid-19 (pandemic) on ecotourism

The Covid-19 pandemic and its devastating consequences are being felt across all industries (Hosseini, Paydar, & Hajiaghaei-Keshmeli, 2021). According to the UNWTO (2017), total world tourism has plummeted from 60% in 2017 to 80% in 2020 as a consequence of the lockdown, potentially resulting in the loss of 50 million tourist jobs. More than 90% of the population was subjected to travel restrictions, which partly or completely shut down the tourist industry in several regions (Gössling, Scott, & Hall, 2021). In the post-pandemic era, travel prohibitions and health concerns have had a significant impact on the ecotourism business, its revenue, and employment. For example, Indonesia is in dire need of government assistance and investment to revitalize its ecotourism business (Fernández-Bedoya et al., 2021). In the cases of Ghana's Savannah area and Nepal, people who originally migrated to various areas are now vulnerable since the region lacks employment opportunities. As a result, the search for other livelihood options led to mass reverse migration. The lack of local monitoring of reverse migration triggered illegal logging and poaching of wildlife, affecting the ecotourism conservation goals (Bates, Primack, Moraga, & Duarte, 2020; Maraseni, Poudyal, Aryal, & Laudari, 2022; Soliku, Kyiire, Mahama, & Kubio, 2021). Again, in the post-pandemic era, considering the case of Ho Chi Minh City, Vietnam, locals are trying to use technology and robots to continue ecotourism employment while avoiding too much interaction with visitors. Furthermore, the animal conservation centres also suffered due to insufficient funding (e.g., the Elephant Conservation Centre in Laos) (Jovanović, Mladenović, & Zdravković, 2021). In the case of developed countries like Greece, low tourist demand for gastronomic ecotourism³ led to a rise in the price of its wineries. A similar situation occurred in the Caribbean Islands, Australia, and Morocco, where the local people indulged in the illegal exploitation of natural resources (Fernández-Bedoya et al., 2021).

5. Solution for the adverse outcomes of ecotourism

The literature tries to demonstrate that maximizing potential benefits for biodiversity conservation and planning for a “coexistence” model such as Public-Private Partnership (PPP) would be appropriate for ecotourism management since they have the essential knowledge and expertise (Wickramasinghe, 2013). According to research on Nagarahole (Rajiv Gandhi) National Park and Dubare Elephant Camp performed by Vishwanatha and Chandrashekara (2014), a code of conduct for visitors in these exploited locations should be established to safeguard the traditional value of the sites while also curbing hooliganism. Again, major amenities such as restaurants and resorts should be avoided, but basic facilities such as camping grounds and walking routes should be developed (Brandt & Buckley, 2018). In addition, forest policies should be extensively evaluated and revised to assist indigenous groups (Poyyamoli, 2018). Furthermore, even if there is no systematic research on eco-tour guide training, employing an ecotourism certification system would assist in limiting income leakages (Mgonja et al., 2015). Besides, ecotourism capacity-building initiatives will empower local inhabitants, especially the poor and women, by providing skill development and leadership training (Nyaupane & Poudel, 2011).

Moreover, the prohibition enforcement law and the tradition of hunting by tribal communities near or within some protected areas are very strict. Therefore, the conservation organisation of that area should centralise its focus on community-based initiatives, i.e., community-based ecotourism (CBET) (Kiss, 2004). The important 12 criteria for better CBET development are nature interest, location at PAs, contribution to conservation, education and awareness, short and long-term benefits to local people, ethics and responsibility, sustainability, better management, creating enjoyment and appreciation, small-scale and having adventures in natural activities compared to private company governance (Kry et al., 2020). Home-stay host learning is another key area of CBET management that gives economic incentives in terms of environmental cleanliness, conservation, and sanitation while recognizing local culture (Walter et al., 2018). To accomplish such efficacy in protection, the Sustainable Livelihood Approach (SLA) framework (Shen, Hughey, & Simmons, 2008) is an efficient and suitable strategy that includes natural, financial, physical, social, and human components to raise the quality of life. It then estimates the livelihood activities and their outcomes while taking vulnerability into account. As a result, it will be highly successful in preserving and safeguarding biodiversity with the use of suitable measures via the CBET and SLA frameworks.

Hikmah, Larasati, Purnaweni, and Yuningsih (2020) did a comprehensive literature analysis in Indonesia and concluded that the stakeholder's role is primarily concerned with three major institutions: central and regional governments; the private sector; and the local community. However, the semi-formal organisation provides greater social capital in the development of ecotourism (Funnell & Bynoe, 2007). To ensure that economic benefit spreads to the lowest strata of society, there has always been a need for a “grass-roots level institution” that would allow people the power to make developmental decisions. Such organisations exist as Eco-development Committees (EDCs), Joint Forest Management Committees (JFMCs), Self-Help Groups (SHGs), and others (Vinodan, 2010). Women and other vulnerable groups contribute to the success of EDCs and SHGs. This helps toward the generation of funding for environmental protection at the local level. An extensive study was conducted by Vinodan (2010) using the destination management framework of the Thenmala Ecotourism Project, Kerala (India's first ecotourism project). The project has become widely successful due to the operation of vital institutional ventures

³ Gastronomic Ecotourism: The community collects honey for commercial purposes from the nearby forests (Fernandez-Bedoya, Meneses-La-Riva, & Suyu-Vega, 2021).

such as the Thenmala Ecotourism Promotion Society (TEPS, a community-based venture), the Forest Development Authority (FDA), and SHG under the Kudumbashree program.

In light of the effect of the Covid-19 pandemic, tourism areas must develop action plans centred on the risk perception of “possible visitors” to control and reduce the possibility of the illness spreading (Samdin, Abdullah, Khaw, & Subramaniam, 2021). Even ecotourism centres (ECs), the most significant component of ecotourism supply chains, may repair their strained economic situations and maintain regular tourists in the post-pandemic era (Hosseini et al., 2021; Soliku et al., 2021). Forecasting tourist demand from ECs would also produce revenue and market share due to the demand multiplier effect. Moreover, according to research conducted in Quebrada Verde, Peru, the community has a strong social structure and cultural identity entrenched in its customs and traditions, which benefited them in appropriate planning management to handle Covid-19 adversities (Gabriel-Campos, Werner-Masters, Cordova-Buiza, & Paucar-Caceres, 2021). Hosseini et al. (2021) concentrated on the construction of E-ecotourism (digital infrastructure) to thrive in business and outperform rivals in a competitive setting. Also, local ecotourism goods must be diversified and marketed to compensate for lost revenue (Stone et al., 2021). This will help to boost the economy and retain customers via an appropriate communication channel. As a result, Jaipuria, Parida, and Ray (2021) proposed that authorities should promote tourism sites with a stronger emphasis on domestic travellers by providing better financing options. According to Ghosh's (2020) intriguing research, all stakeholders should become “glocal” (global plus local) rather than “global.” Maraseni et al. (2022) also addressed how ecotourism will handle reverse migration induced by the pandemic in the short run by using different livelihood alternatives. It may also stimulate rural creativity and production since returnees will utilise their past technical knowledge and practical skills to create new possibilities. There are opportunities to create low-cost area-specific items with significant revenue and employment potentials, such as medicinal plants and crafts, bio-composting, vermicomposting, floriculture, and mushroom cultivation. Moreover, the production process can use various cost-effective technologies like water harvesting tank technology (Singh, Ghosh, & Lata, 2020). Also, the state government might establish mechanisms for selling high-value commodities, including tea, wild foods, and medicinal and aromatic plants. Therefore, technical and financial assistance in the form of soft loans can be offered to migrant workers for new business initiatives (ibid).

The identification of prospective “eco-tourists” and marketing of eco-certification programs is critical since there is little evidence that the eco-tourist as a defined market exists as researched by Sharpley (2006). Eco-tourists' level of care for the environment may therefore be determined by identifying them based on the nature and learning criteria of ecotourism and assessing their pro-environmental sentiments using an attitudinal scale. The most suitable approach to handle the problem of greenwashing is via an ecotourism certification scheme (Mgonja et al., 2015). The United States offers the Sustainable Tourism Eco-Certification Scheme (STEP), whereas Australia has a worldwide known eco-certification program. Since 2002, ECOCERT has been functioning in Aurangabad and Gurgaon, India. It certifies organic agriculture, environmental management systems, natural ecological goods, organic and ecological textiles, and other products. Furthermore, encouraging Green Accommodation will result in the adoption of environmentally beneficial activities such as the use of biodegradable materials, upscaling methods, recycling, and re-use, all of which will help the local businesses and communities.

Again, as witnessed in the example of Rwanda, ecotourism raises awareness and understanding of the national relevance of wildlife conservation via training programs and incentives. Former poachers are now hired as guides or conservationists, monetising their knowledge of wildlife and its habitat (Black & Cobbinah, 2018). Furthermore, local community skill development via ecotourism minimizes the migration of local people to metropolitan regions in search of a job and lowers crime rates, as shown in the instance of Ambua Lodge in Papua New Guinea (Wearing & Neil, 2009). Also, eco-tourists may learn about and participate in ecotourism by using ICT (Information & Communication Technology). It will increase travellers' knowledge of environmental and cultural factors, which will improve their understanding of the potential negative environmental implications of ecotourism and its repercussions on local ecosystems (Chai-Arayalert, 2020).

6. Conclusions, implications for future studies, and limitations

The major goal of this review is to assist readers to comprehend the current literature on ecotourism in various developing and developed nations and identify research needs for future study. Initially, ecotourism studies were selected and scrutinized. The relevant papers were then categorized, and a research plan with suggestions was developed. Considering the experience of ecotourism throughout the world, the paper concludes that, undoubtedly, ecotourism has proven to be an effective environmental conservation and livelihood restoration tool across many regions. It ensures the sustainable use of natural resources by reducing carbon footprints and creating various income opportunities for indigenous peoples to improve their livelihoods. The existence of a relationship between ecotourism and five livelihood assets (natural, physical, human, social, and financial), as argued by much literature, gives a larger notion of addressing a sustainable livelihood framework. Furthermore, community-based ecotourism (CBET) functions as a bridge between indigenous communities and biodiversity by reducing people's reliance on natural resources.

On one hand, many destinations, including Kruger National Park in South Africa (Turner, 2004), Iwokrama rain forest in Guyana (Funnell & Bynoe, 2007), Chitwan National Park in Nepal (Nyaupane & Poudel, 2011), Kakamega rainforest (Barry, 2012), and Fray Jorge National Park (Qashu, 2012), have achieved the desired results from ecotourism. On the other hand, ecotourism destinations, such as Andaman and Nicobar Islands (Reddy, 2008), Yunnan, China (Brandt et al., 2019), Can Gio Mangrove

Biosphere, Vietnam, and Maasai Mara, Kenya (Tran & Walter, 2014), Sundarbans biosphere reserve, India (Spicer, 2020), and Quintana Roo, Mexico (Morgan & Winkler, 2020), face numerous challenges due to their adverse impacts. As a result, it is vital to comprehend the failure of ecotourism programs and how similar circumstances might be avoided in the future. In this respect, the research investigates the beneficial effects of ecotourism as well as the difficulties and solutions to these obstacles.

But, ecotourism is questioned as a sustainable factor due to its ambiguous definitions, policy failures, and implementation (Butcher, 2007; Butler, 2018). In certain developing countries, ecotourism has primarily been employed as a marketing tool (Sharpley, 2006) in the form of greenwashing (Judkis, 2008). Developing nations often accept any ecotourism development strategy for financial gain, ignoring the long-term environmental and socio-cultural consequences. According to the literature, many ecotourism development programs are fundamentally western-centric with little incorporation of indigenous knowledge. Furthermore, bad governance, stakeholder disputes, political corruption, and low local community engagement with the notion that “one size fits all” contribute to it (Wondirad, 2019). It is said that eco-tourists visit more remote places, generating income and increasing local engagement in tourism development (Mgonja et al., 2015), but its sustainable motive is questioned by Butler (2018). So, local people should be given not just participation but also decision-making authority. This strategy should be used in rural home-stays, eco-lodges, and nature camps. Furthermore, environmental education is a critical aspect for stakeholders in the ecotourism industry to successfully promote conservation initiatives. Also, it is essential to understand the hurdles that prevent local communities from using environmentally friendly technology.

The research gaps based on descriptive analysis posit that the majority of research focuses on visitors and the local population, but few studies explain the role of government and NGOs. Also, studies on tour operators who assist tourism activities and ecotourists in ecotourism areas are disregarded. Future research needs to include tour guides who share environmental knowledge with eco-tourists and hotels/tour operators. Promoting economic well-being in the community should be included in the study. In addition, conducting a comparative study of stakeholders based on ecotourism advantages would promote social harmony by addressing underlying community challenges. In general, ecotourism is considered a “win-win strategy” for underdeveloped nations as it depends upon four sustainable factors, i.e., ecological, economic, social, and institutional aspects (Sahani, 2021), and in this review, the majority of research is related to economic factors, which emphasize the relevance of local people's livelihood. As a result, the study's importance has expanded to include psychological, technical, and political elements (Butler, 2018). Furthermore, in the face of a rapidly disappearing biodiversity due to global warming and climate change, concentrating on industry-oriented ecotourism research may make a significant contribution to the sector's long-term growth.

Nonetheless, future research on the efficacy of conservation policies and laws on environmental impact assessment (EIA) should get greater attention (Puri, Karanth, and Thapa, 2019). Similarly, research on the carrying capacity of social and ecological effects, as well as monitoring changes in land use and resource consumption patterns, should be conducted (Spicer, 2020). Ecotourism funds should be invested in the local social sector regularly (primary schools, sanitation, etc.). Furthermore, a substantial study on ecotourism management in the post-pandemic period is required. To attract more visitors, the Tourism Ministry of India has launched the “Atithi Devo Bhavah” (Guest is God) campaign. The approach is now geared toward capacity development for stakeholders involved in biodiversity protection. Along with it, the phrase “Prakriti Devo Bhavah” (Nature is God) should be introduced. Furthermore, regional policymakers must make evidence-based judgments and develop suitable policies and strategies to balance land-use trade-offs between environmental protection and meeting urgent human needs (Wickramasinghe, 2013). Therefore, the present article is intended to raise awareness and advocate for further policy-oriented work and case study-driven research on ecotourism's dual effects on biodiversity conservation and local livelihoods.

There are some limitations to the present study that should be addressed in future research. The scope of the analysis is restricted to 90–100 papers, and studies before 2002 are not included. The articles were first gathered from several databases and library services. For future research projects, searches may be expanded to include platforms other than Science Direct and Web of Science. Specific databases like Scopus and focusing on only articles (document type) will provide more clarity for a detailed study. Future research should focus on ecotourism's influence on wildlife, ecotourism in wetland or marine ecosystems, a conceptual study of ecotourism, and artificial intelligence-based ecotourism.

Ethical statement

Hereby, I, Ms. Rajashree Samal (Co-author: Dr. Madhusmita Dash) consciously assure that for the manuscript titled “Ecotourism, biodiversity conservation, and local livelihoods: Understanding the convergence and divergence” fulfilled the following:

- 1) This material is the authors' own original work, which has not been previously published elsewhere.
- 2) The paper is not currently being considered for publication elsewhere.
- 3) The paper reflects the authors' own research and analysis in a truthful and complete manner.
- 4) The paper properly credits the meaningful contributions of co-authors and co-researchers.
- 5) The results are appropriately placed in the context of prior and existing research.
- 6) All sources used are properly disclosed (correct citation). Literally copying of text must be indicated as such by using quotation marks and giving proper references.
- 7) All authors have been personally and actively involved in substantial work leading to the paper, and will take public responsibility for its content.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Appendix A

Table A.1

Study categorization using the classification framework.

Serial No.	Authors	Countries/ Existing PAs	Emphasis on ecotourism	Research method	Type of analysis	Key stakeholder	Factors linked to ecotourism	Impact of ecotourism
1	Adamu et al. (2015)	3	7	11	12	16	20, 21	24
2	Adom (2019)	3	6	10	14	15	22	25
3	Agrawal and Redford (2006)	1, 2, 3	5	10	13, 14	19	20, 21, 22, 23	26
4	Anup et al. (2021)	3	7	11	12, 14	15, 17	20, 21, 22	24
5	Ashok et al. (2017)	3	7	11	12, 13, 14	19	20, 21, 22, 23	26
6	Badola et al. (2018)	3	7	11	12	15	20	26
7	Barry (2012)	3	6	10	14	15	21, 22	24
8	Bates et al. (2020)	1, 2, 3, 4	8	10	12	19	20, 21	26
9	Belsoy et al. (2012)	3	8	10	14	15	20, 21	26
10	Bhandari and Jianhua (2017)	3	8	10	12	15	20, 21	26
11	Black and Cobbinah (2018)	3	8	11	12, 14	15, 17	21	24
12	Brandt and Buckley (2018)	1, 2, 3, 4	7	10	12, 13	19	20, 21	25
13	Brandt et al. (2019)	3	6	10	14	15	20, 21	25
14	Broadbent et al. (2012)	2	6	9	14	15	21	25
15	Butarbutar and Soemarno (2013)	3	6	10	14	19	21	25
16	Butcher (2006)	1, 2, 3, 4	5	10	13	19	20, 21, 22, 23	26
17	Cabral and Dhar (2019)	3	7	10	13	19	20, 21, 22, 23	26
18	Chai-Arayalert (2020)	2	5	9	12, 14	16	20	24
19	Chandel and Mishra (2016)	1, 2, 3, 4	5	10	13	15	21, 22	24
20	Coria and Calfucura (2012)	1, 2, 3, 4	5	10	13	15	20, 21	26
21	Das and Chatterjee (2015)	1, 2, 3, 4	7	10	13	19	20, 21, 22, 23	26
22	Deori and Das (2013)	3	5	10	12	15	21	24
23	Doan (2010)	1, 2, 3, 4	7	10	12, 14	19	20, 21, 22, 23	26
24	Eagles (2002)	1, 2, 3, 4	8	9	12	16, 17	20	24
25	Ferraro and Hanauer (2014)	1, 2, 3, 4	8	9	12	19	20, 21, 22, 23	24
26	D'Angella and Go (2009)	1, 2, 3, 4	8	9	12, 14	19	23	24
27	Funnell and Bynoe (2007)	2	6	9	12, 14	15, 18	23	24
28	Gabriel-Campos et al. (2021)	2	5	10	14	15	20, 21, 22, 23	24
29	Ghodeswar (2013)	3	6	10	14	19	20, 21, 22, 23	24
30	Ghosh (2020)	2	8	11	12, 14	19	20, 23	24
31	Ghosh-Harihar et al. (2019)	3	6	10	13, 14	15, 18	21, 23	25
32	Gössling et al. (2021)	1, 2, 3, 4	8	11	12	19	20, 21, 22, 23	25
33	He et al. (2008)	2	7	10	12, 14	19	20, 23	26
34	Hikmah et al. (2020)	3	6	10	14	18	23	24
34	Honey (2008)	1, 2, 3, 4	5	11	14	19	20, 21, 22, 23	24
36	Honey and Gilpin (2009)	1, 2, 3, 4	8	10	13	15	20, 21, 22	26
37	Hosseini et al. (2021)	1, 2, 3, 4	5	9	12	17	20, 23	24
38	Hypolite et al. (2002)	2	7	10	14	15	21	24
39	Irandu and Shah (2014)	1, 2, 3, 4	6	10	14	15	22	24
40	Jaipuria et al. (2021)	1, 2, 3, 4	8	9	12	19	20, 21	25
41	Judkis (2008)	1, 2, 3, 4	5	10	14	19	23	25
42	Kiper (2013)	1, 2, 3, 4	7	10	13	19	20, 21, 22, 23	26
43	Kiss (2004)	1, 2, 3, 4	5	10	13	15	20, 21, 22, 23	24
44	Kline (2011)	1, 2, 3, 4	7	10	13	19	20, 21, 22	26
45	Kry et al. (2020)	3	7	11	12	15	20, 23	24
46	Lacher and Nepal (2010)	3	6	10	14	15	20	25
47	Lee et al. (2010)	1	6	9	12	16, 17	20	25
48	Lenao and Basupi (2016)	2	6	10	13	15	22	24
49	Magio, Velarde, Santillan, & Rios, 2013	2, 3	5	10	13	15, 18	23	25
50	Magray (2018)	3	7	10	13, 14	15	22	25
51	Makindi (2016)	3	6	10	14	15	20	24
52	Masud et al. (2017)	2	7	9	12, 14	15	20, 22	24
53	Mbaiwa and Stronza (2010)	2	8	11	12, 14	15	20, 21	24
54	Mgonja et al. (2015)	3	5	10	13	19	20, 21, 22	26
55	Morgan and Winkler (2020)	2	6	10	13, 14	15	22	25
56	Moswete and Lacey (2015)	2	6	10	14	15	22	24
57	Newsome et al. (2002)	1, 2, 3, 4	8	10	14	19	20, 21, 22	26
58	Nyaupane and Poudel (2011)	3	8	10	14	19	20, 21, 22, 23	26
59	Osman et al. (2018)	3	6	10	14	19	22	24

Table A.1 (continued)

Serial No.	Authors	Countries/ Existing PAs	Emphasis on ecotourism	Research method	Type of analysis	Key stakeholder	Factors linked to ecotourism	Impact of ecotourism
60	Ouboter et al. (2021)	2	6	11	14	15	21	24
61	Plummer and Fennell (2009)	1, 2, 3, 4	8	10	14	19	23	25
62	Poyyamoli (2018)	1, 2, 3, 4	5	10	13	19	20, 21, 22, 23	24
63	Puri, Karanth and Thapa (2019)	3	7	11	13	19	20, 21, 22, 23	24
64	Qashu (2012)	1	5	10	14	15	22	24
65	Reddy (2008)	3	7	11	12, 14	19	20, 23	25
66	Reimer and Walter (2013)	3	5	10	14	19	20, 21, 22, 23	26
67	Ruiz-Ballesteros and Hernández-Ramírez (2010)	2	5	10	14	19	20, 21, 22, 23	25
68	Samdin et al. (2021)	2	6	9	12	15, 16, 17	20, 21, 22, 23	24
69	Santarém et al. (2018)	3	5	11	12, 14	15	21	26
70	Sharpley (2006)	1, 2, 3, 4	5	10	13	19	20, 21, 22, 23	25
71	Shen et al. (2008)	1, 2, 3, 4	8	10	14	15, 16	20, 21, 22, 23	24
72	Sinha et al. (2012)	3	7	9	12, 14	15	20, 21	24
73	Sirivongs and Tsuchiya (2012)	3	5	9	12	15	20, 21	24
74	Soliku et al. (2021)	3	5	10	12, 14	19	20	24
75	Song and Kuwahara (2016)	1	5	11	14	16, 17	20, 22	24
76	Spicer (2020)	3	7	10	13	15, 18	20, 21, 22	26
77	Stone et al. (2021)	2	6	10	13	15	20, 21, 22, 23	24
78	Stronza and Durham (2008)	1, 2, 3, 4	5	11	12, 14	19	20, 21, 22, 23	25
79	Thrane (2008)	1	6	9	14	15	22	25
80	Tran and Walter (2014)	3	6	10	14	15	22	25
81	Tucker and Boonabaana (2012)	3	6	10	14	15	22	25
82	Turner (2004)	2	8	10	14	15, 16	20, 21, 22, 23	24
83	Vinodan (2010)	3	6	11	12, 14	19	23	24
84	Vishwanatha and Chandrashekara (2014)	3	6	11	12, 14	19	21	24
85	Walter et al. (2018)	3	6	10	14	15	20, 21, 22	24
86	Wang et al. (2014)	2	6	9	12	19	21	24
87	Wearing and Neil (2009)	1, 2, 3, 4	5	10	14	19	20, 21, 22, 23	26
88	Wearing et al. (2005)	1, 2, 3, 4	6	10	13	18	23	24
89	Wickramasinghe (2013)	3	7	10	14	18	20, 23	24
90	Wishitemi et al. (2015)	3	6	11	12, 14	15, 16, 17	20, 21	25
91	Hasana et al. (2021)	1, 2, 3, 4	6	10	13	15	20, 21, 22, 23	26
92	Jovanović et al. (2021)	1, 2, 3, 4	6	11	12, 14	19	21	25
93	Delang (2006)	2	8	9	12, 14	15, 18	20	24
94	Ma et al. (2019)	2	7	9	12	15	20	26
95	Fernández-Bedoya et al. (2021)	1, 2, 3, 4	6	10	13	19	20, 21	26
96	Butler (2018)	1, 2, 3, 4	5	10	14	19	20, 21, 22, 23	26
97	Sahani (2021)	3	5	11	12, 14	19	20, 21, 22, 23	26
98	Wondirad (2019)	1, 2, 3, 4	7	11	13	19	20, 21, 22, 23	26
99	Self et al. (2010)	2	6	11	14	17, 18	20, 21	25
100	Butcher (2007)	3, 4	5	10	13, 14	19	20, 21, 22, 23	25
101	Haaland and Aas (2010)	1, 2	6	10	14	19	20, 21	24

Note: The codes/numbers represent the sub-categories considered (refer to codes in Table 2).

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